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PEOPLE'S REPUBLIC OF CHINA SCIENTIFIC ABSTRACTS  
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## PEOPLE'S REPUBLIC OF CHINA SCIENTIFIC ABSTRACTS

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ACTA ZOOLOGICA SINICA

AUTHOR: None

ORG: The Second Laboratory, Shanghai Institute of Experimental Biology

TITLE: "Through the Achievements in the Discovery of Trichosanthin in Inducing Abortion to See the Bankruptcy of the Fallacy That Upsets the Relationship Between Theory and Practice"

SOURCE: Peking TUNG-WU HSUEH-PAO [ACTA ZOOLOGICA SINICA] in Chinese No 2, Jun 76 pp 122-125

TEXT OF ENGLISH ABSTRACT: Radix tricosanthes is one of the precious treasures handed down from the old Chinese folk medicine. Its discovery and the development as an abortifacient is a fruitful achievement obtained through the integration of the Western and Chinese medicine, and also through the realization of carrying on the Party's revolutionary medical line. From its discovery to final extraction and purification of the effective protein moiety, from the successful clinical application to the preliminary elucidation of its mechanism of action, it follows the Marxist ideology of "practice-theory-practice" and strongly rebuts the fallacy that opposes the open-door research.

Author: None

ORG: The Second Laboratory, Shanghai Institute of Experimental Biology

TITLE: "Studies on the Mechanism of Abortion Induction by Trichosanthin"

SOURCE: Peking TUNG-WU HSUEH-PAO [ACTA ZOOLOGICA SINICA] in Chinese No 2, Jun 76 pp 126-136

EXCERPT OF ENGLISH ABSTRACT: Radix trichosanthes is an abortifacient drug of mid-gestation and is extracted from the root tuber of Trichosanthes kirilowii Maxim (Cucurbitaceae.) The purified effective principle is a basic protein of molecular weight of approximately 18,000 and is named "Trichosanthin." It is proved to be very effective in abortion induction of mid-gestation, particularly effective in treating ectopic pregnancy, hydatidiform mole, and invasive mole, and it has also some therapeutic action on choriocarcinoma. Based upon the experimental results on its initial site of action, its morphological and functional injury on trophoblast cells of placenta both in vivo and in vitro and its effect on prostaglandin synthesis are discussed. The preliminary elucidation of the mechanism of this drug on abortion induction has afforded basis for the clinical application with better efficacy and its possible use for an abortifacient in early pregnancy as well as for the discovery of newer cancer chemotherapeutic agents.

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TITLE: "Preliminary Studies on Purification and Characterization of an Abortifacient Plant Protein, Trichosanthin"

SOURCE: Peking TUNG-WU HSUEH-PAO [ACTA ZOOLOGICA SINICA] in Chinese No 2, Jun 76 pp 137-143

TEXT OF ENGLISH ABSTRACT: Trichosanthin is an abortifacient plant protein isolated from Redixtrichosanthes, the root tuber of Trichosanthes kirilowii Maxim (Cucurbitaceae.) The crude extract of Redix trichosanthes has been used successfully as an abortifacient drug of mid-gestation as well as a drug against trophoblastic tumors. The abortifacient efficient component was isolated from the crude extract and purified by chromatography on CM-Sephadex C-50, and characterized as a basic protein with a molecular weight of approximately 18,000 and an isoelectric point of pH 9.4. The relation between the molecular properties and the specificity of its toxic action on normal and malignant trophoblasts was discussed.

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TITLE: "The Distribution and Mode of Excretion of the  $I^{131}$ -Labelled Crude Extract of Radix Trichosanthis in Pregnant Women"

SOURCE: Peking TUNG-WU HSUEH-PAO [ACTA ZOOLOGICA SINICA] in Chinese No 2, Jun 76 pp 144-148

TEXT OF ENGLISH ABSTRACT: Clinical investigations have shown that in comparison with other abortifacient methods in common use, trichosanthin possesses the advantages of high efficacy, safety, and abundance of raw material. In order to explore the mechanism of its abortifacient action, a comparative study on the distribution and mode of excretion of the  $I^{131}$ -labelled crude extract of Radix trichosanthes by different routes of administration in pregnant women was undertaken. It was found that the drug given by venous infusion had the highest excretion rate. When the drug was injected intramuscularly, it was released slowly from the injection site and therefore its action could be maintained for

[continuation of TUNG-WU HSUEH-PAO NO 2, 1976 pp 144-148]

a longer period. The result is of more significance in that with intra-amniotic routes the radioactivity in the amniotic fluid was maintained very high till the time of delivery but only very low radioactivity was found in all other organs and in the urine. It is thus suggested that at most trichosanthin passes slowly through the amnion and the placental barrier. This probably affords an explanation of the clinical observations that in cases of intra-amniotic injection side effects were much milder than those of intramuscular injection. For those pregnant women with some contraindications (e.g. hepatitis, nephritis, etc.) but are in urgent need of termination of gestation, intra-amniotic injection affords a preferable route of administration.

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TITLE: "Studies on the Site of Action of Induced Abortion by Trichosanthin"

SOURCE: Peking TUNG-WU HSUEH-PAO [ACTA ZOOLOGICA SINICA] in Chinese No 2, Jun 76 pp 149-155

EXCERPT OF ENGLISH ABSTRACT: In order to clarify the mechanism of abortion induction of trichosanthin, whether it exerts its action directly on the placenta and/or on fetus should be considered first. We have carried out experiments with mice on the 10th day of gestation. By indirect immuno-fluorescent technique, the distribution of the drug was traced in the placental and fetal tissues during different intervals after the administration of 2 mg and 0.2 mg of purified preparation per mouse. The results of the experiments were summarized. From the results it can be concluded that in the induced abortion of mid-gestation trichosanthin exerts its action directly on the placenta. With exception of fetal erythrocytes, no conjugation of trichosanthin with other fetal tissues have been observed. The initial site of action is mainly confined to trophoblasts, and there exists a certain degree of cellular specificity.

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TITLE: "Investigations on the Injurious Effects of the Abortifacient Trichosanthin to Monkey Placental Villi"

SOURCE: Peking TUNG-WU HSUEH-PAO [ACTA ZOOLOGICA SINICA] in Chinese No 2, Jun 76 pp 156-165

EXCERPT OF ENGLISH ABSTRACT: Serious pathological changes were observed on the placentae of abortuses induced with the abortifacient trichosanthin, but the clinical specimens of earlier changes could not be obtained from the patients. For the purpose of elucidating the earliest and causative pathological changes we have undertaken systematic observations on the placental villi of rhesus monkey, *Macaca mulatta* (Zimmermann,) after the abortive induction by trichosanthin injection. Intramuscular injection of 2 mg of the purified drug would induce abortion in the monkey of mid-gestation after 99.5 hours. Placental specimens for histological observations were taken by laparatomy of 13 monkeys of mid- and late-gestation at different intervals after administration of the drug (1.4-2mg.) It was observed that the injury on the syncytiotrophoblasts was the initial and decisive effect followed by circulation hinderance and

[continuation of TUNG-WU HSUEH-PAO No 2, 1976 pp 156-165]

and tissue necrosis. Besides, when severe injurious effects appeared in the syncytiotrophoblasts (24-48 hr,) the cytotrophoblasts and core mesenchymal cells of the villi appeared completely uneffected, even the decidual cells nearby the trophoblastic shell showed no pathological changes. Therefore it might be said that some specific injurious effects of trichosanthin to the syncytiotrophoblast of the placental villi occurred at the very early stage after injection.

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TITLE: "Serum HCG Levels of Women During and After Abortion Induced by Trichosanthin"

SOURCE: Peking TUNG-WU HSUEH-PAO [ACTA ZOOLOGICA SINICA] in Chinese No 2, Jun 76 pp 166-171

EXCERPT OF ENGLISH ABSTRACT: Changes of serum HCG level of second trimester pregnant women subjected to induced abortion by a single injection of the crude extract of *Radix trichosanthes* were examined with radioimmunoassay. The dosages used for intramuscular injection and for intraamniotic injection were 6-10mg and 12.5 mg respectively. It was found that in either routes the concentration of serum HCG fell rapidly; 24 hours after injection it was lower than half of the original value; on the 3rd day it approached the threshold value of spontaneous abortion; and several days afterwards abortion occurred. All the results so far obtained indicate that trichosanthin exerted rapidly its injurious effect on the endocrine function of the syncytiotrophoblasts. It should be mentioned that the decrement rate in the levels of HCG 24 hours after injection showed some variations among individual patients.

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ORG: All of Shanghai Institute of Experimental Biology

TITLE: "Study on the Effects of Trichosanthin on Human Trophoblast Cells in Vitro"

SOURCE: Peking TUNG-WU HSUEH-PAO [ACTA ZOOLOGICA SINICA] in Chinese No 2, Jun 76 pp 172-179

EXCERPT OF ENGLISH ABSTRACT: By using radioimmunoassay of double antibody method, the cumulative content of HCG in the culture medium after the placental pieces of mid-gestation were cultured for 3 days reached 40 mg/ml. When 10  $\mu$ g of the purified protein was added to 3 ml of culture medium, the HCG secretion of the cultured cells was apparently inhibited. In contrast, HCG content of the control series increased steadily within 3 days after changing of the culture medium. Organ piece culture of placenta of early gestation (within 2 months of pregnancy) gave the same results. No injurious effects were found with other types of cultured cells, e.g. human amniotic cells and cells of hepatic carcinoma, even with tenfold increase of dosage of the purified protein.

AUTHOR: CHU Yen-p'ing [2612 1484 1627]  
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TITLE: "Studies on the Relationship Between Endogenous Synthesis of Prostaglandins and Abortion Induction by Trichosanthin"

SOURCE: Peking TUNG-WU HSUEH-PAO [ACTA ZOOLOGICA SINICA] in Chinese No 2, Jun 76 pp 180-186

TEXT OF ENGLISH ABSTRACT: It is known that in animals treated with drugs such as aspirin to inhibit endogenous synthesis of prostaglandins, delivery will be delayed. In order to clarify the relationship between endogenous prostaglandins and induced abortion by trichosanthin, we have carried out experiments with mice of late-gestation. Each of the control mice was injected at the 17th day with 0.3 mg of the purified preparation of trichosanthin and abortion was induced on an average of 20.5 hours after injection. When a mixture of 3.15 mg of aspirin or 3 mg of amidopyrin and 0.3 mg of the purified preparation was injected to mice at the 17th day of gestation, abortion was not delayed, but induced at just the same time as in the control group. This signifies that these drugs could not antagonize with the abortion effect of trichosanthin. When aspirin or amidopyrin (5mg) was fed to mice from the 15th to 18th day of

[continuation of TUNG-WU HSUEH-PAO No 2, 1976 pp 180-186]

gestation to inhibit the endogenous synthesis of prostaglandins, and the purified preparation was injected at the 17th day of gestation, induction was either evidently delayed to about 60 hours after injection or inhibited with fetuses dying in uterus. The results indicate that during the process of abortion induction by trichosanthin it seems necessary to have endogenous prostaglandins to initiate uterine contraction, and if the synthesis of endogenous prostaglandins is inhibited, parturition will be delayed or inhibited.

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TITLE: "Preliminary Study on the Relationship Between the Immunogenic Inhibition by Phenargen and the Termination of Pregnancy of Trichosanthin"

SOURCE: Peking TUNG-WU HSUEH-PAO [ACTA ZOOLOGICA SINICA] in Chinese No 2, Jun 76 pp 187-191

TEXT OF ENGLISH ABSTRACT: In order to clarify the relationship between the immunogenic action and abortion induced by trichosanthin, phenargen, an inhibitor of antibody formation and delayed hypersensitivity, was used in an experiment with mice at the 10th day of gestation. The results showed that phenargen inhibited the allergic reaction to the crude extract of Radix trichosanthes, but did not affect the fetus. Under the condition of inhibition of allergy by phenargen, abortion was still induced by the injection of the crude extract. Thus, the possibility of induction of abortion through immunologic response was eliminated. The clinical significance of these results was discussed.

AUTHOR: YANG Ts'un-chung [2799 1317 6945]

ORG: Theoretical Study Group, Peking College of Medicine

TITLE: "One of the Brilliant Achievements in the Preparation and Use of Sex Hormones in the Eleventh Century in China"

SOURCE: Peking TUNG-WU HSUEH-PAO [ACTA ZOOLOGICA SINICA] in Chinese No 2, Jun 76 pp 192-196

EXCERPT OF ENGLISH ABSTRACT: The preparation and use of sex hormones in China may be dated back to as early as the 11th century. By using a series of chemical and physical processes, such as precipitation of steroids with saponin, filtration, sublimation, etc. to prepare Ch'iu Shih (Autumn Mineral) a preparation of sex hormones in relatively purified form was in fact obtained. Such preparations were used in those days as a tonic and an aphrodisiac with good effects. A prescription called Ch'iu-shih Fang [A Prescription for Making Autumn Mineral] can be found in a medical book of the middle ages, entitled SU SHEN LIANG FANG [SU AND SHEN'S VALUABLE PRESCRIPTIONS] reprints of which are still available today. This is certainly the most detailed and reliable record of the preparation and use of sex hormones in Chinese classic literatures. This record is proved to be the work of a famous legalist SHEN K'uo [3088 2161] (sometimes spelled SHEN Kua, 1031-1095 A.D.) This detailed record is undoubtedly another important contribution of his to the history of science and technology of mankind.

AUTHOR: None

ORG: Physiology Section, Department of Endocrinology, Peking Institute of Zoology, Chinese Academy of Sciences

TITLE: "The Effect of  $\text{PGE}_2$  and  $\text{PGF}_{2\alpha}$  Upon the Histo- and Histochemical Changes of the Ovary and the Uterus of Mice in Early Pregnancy"

SOURCE: Peking TUNG-WU HSUEH-PAO [ACTA ZOOLOGICA SINICA] in Chinese No 2, Jun 76 pp 197-202

EXCERPT OF ENGLISH ABSTRACT: When  $300\mu\text{g} \times 3,300\mu\text{g} \times 2$   $\text{PGE}_2$  or  $250\mu\text{g} \times 2$   $\text{PGF}_{2\alpha}$  were administered subcutaneously on the 5th and/or 6th day of pregnancy and autopsy was carried out on the 7th day, antifertility effects are 100, 62.5 and 87.5% respectively. Neither  $\text{PGE}_2$  nor  $\text{PGF}_{2\alpha}$  showed any effect upon the activity of  $3\beta$  hydroxysteroid dehydrogenase in the corpus luteum of the pregnant mice as compared with those of the controls. Marked histological changes were observed in the uterus, especially in the decidua. A zone, composed of small, undifferentiated cells, between the stroma and degenerated decidua appeared subsequently, and this is the area where the decidua would eventually slough off from the uterine wall. The reappearance of AKP on the luminal end of the uterine epithelium is also an indication of earliest antifertility changes induced by PGs. From this study it is clearly shown that in early pregnancy, uterine contraction leading to abortion may be secondary to decidual degeneration.

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TSAO Kang [6760 1481]

ORG: All of Shanghai Institute of Pharmacology, Chinese Academy of Sciences

TITLE: Anti-Ovulatory Effect of Hypothalamic Medroxyprogesterone or Megestrol Implants in the Rabbit

SOURCE: Peking TUNG-WU HSUEH-PAO [ACTA ZOOLOGICA SINICA] in Chinese No 2, Jun 76 pp 203-206

TEXT OF ENGLISH ABSTRACT: A study has been made of the anti-ovulatory action of localized implants of medroxyprogesterone or megestrol in the hypothalamus of mature female rabbits. A minute amount (less than 0.5 mg) was implanted stereotactically, and the copulation-induced ovulation was tested about 15 days later. When medroxyprogesterone was implanted bilaterally in the median eminence of the hypothalamus, ovulation was blocked in 8 out of 9 rabbits and the mean number of ovulatory points was  $1.0 \pm 3.0$ . When megestrol was implanted bilaterally in the median eminence, ovulation was blocked in 6 out of 7 rabbits and the mean number of ovulatory points was  $0.7 \pm 1.8$ , while none of the 3 rabbits with unilateral implants ovulated. No blockade of ovulation was

[continuation of TUNG-WU HSUEH-PAO No 2, 1976 pp 203-206]

observed with bilateral cholesterol implants in the same site, while 4 out of 5 rabbits ovulated with bilateral megestrol implants in the thalamus and the mean number of the ovulatory points was  $5.8 \pm 2.4$  and  $4.6 \pm 2.7$  respectively. These results are consistent with the hypothesis that the site of anti-ovulatory effect of the anti-fertility steroids resides in the median eminence of the hypothalamus.

AUTHOR: None

ORG: Department of Ecology, Peking Institute of Zoology, Chinese Academy of Sciences

TITLE: "Effect of the Male Odor on the Sexual Maturation of the Female Mice"

SOURCE: Peking TUNG-WU HSUEH-PAO [ACTA ZOOLOGICA SINICA] in Chinese No 2, Jun 76 pp 207-212

TEXT OF ENGLISH ABSTRACT: The experiments were carried out from June to August in 1973 and from October 1973 to January 1974. Twenty-day old female mice were exposed periodically to the male odor. The results are: (1) Under the effect of the male odor, the sexual maturation of the young females is significantly accelerated (Table 1-2); (2) The body weights of the precocious females are about the same as those of the controls (Table 3); (3) The effective intensity of the male odor on the sexual maturity is proportional to the body weight of the immature female mice. The larger individuals respond to the male odor more remarkably than the smaller ones (Fig. 2); (4) The ovaries and adrenal glands of the precocious individuals are not significantly larger than those of the controls (Table 4.).

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TITLE: "A New Method for the Evaluation of Radioprotective Substances by Chromosome Aberration in Peripheral Lymphocytes"

SOURCE: Peking TUNG-WU HSUEH-PAO [ACTA ZOOLOGICA SINICA] in Chinese No 2, Jun 76 pp 213-218

TEXT OF ENGLISH ABSTRACT: Blood samples taken from the Rhesus monkey (*Macaca mulatta*) 2 hours after oral administration of cystamine-HCl (350-400 mg/kg) were irradiated with different doses of gamma rays. Following irradiation the lymphocytes from the peripheral blood were cultured *in vitro* for the analysis of chromosome aberrations in metaphase. On the other hand, blood samples drawn before the administration of cystamine treated and cultured in the same way served as controls. The radioprotective effect of cystamine was thus determined quantitatively on the basis of chromosome aberrations. The results indicate that the radioprotective action of cystamine-HCl is reflected both in the total number of chromsome aberrations as well as the percentage of aberrant cells in comparison with the irradiated controls. The DRF thus calculated was 1.73 and 1.60 respectively. The significance of this work lies on the fact that in the clinical applicationof some radioprotective substances the effective doses of the drug and the relative duration of action can easily be determined by this method.

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CSO: 4009

ACTA PHYSICA SINICA

AUTHOR: None

ORG: Laser Crystals Research Group, Shanghai Institute of Optics and Fine Mechanics, Chinese Academy of Sciences

TITLE: "Studies on Dislocations in Neodymium-Doped Aluminium-Yttrium Garnet (Nd-YAG)"

SOURCE: Peking WU-LI HSUEH-PAO [ACTA PHYSICA SINICA] Vol 25 No 4, July 76  
pp 284-291

TEXT OF ENGLISH ABSTRACT: For high perfection of structure in Nd-YAG laser crystals grown by the Czochralski method, the dislocation density of the crystals must be decreased. Research study seems to indicate that the direction of dislocation propagation is perpendicular to the solid-liquid interface. In crystals grown with a convex solid-liquid interface, the low dislocation density is due to spreading out of the dislocations in the central part towards the surrounding areas and the edges. Hence, by applying suitable technology, i.e. intentionally changing the shape of the solid-liquid interface, we can obtain crystals in which not only the dislocations are decreased, but also the facets are eliminated.

This paper was received for publication on 18 December 1975.

AUTHOR: CHANG Chin-shang [1728 4544 0006]  
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TITLE: "Spurious States of Motion of the Center of Mass in the Double Well - Cluster Shell Model"

SOURCE: Peking WU-LI HSUEH-PAO [ACTA PHYSICA SINICA] Vol 25 No 4, July 76  
pp 292-307

TEXT OF ENGLISH ABSTRACT: In this paper we use the microscopic "double well - cluster shell model" to discuss the existence of spurious states of motion of the center of mass during nuclear fission and heavy ion reactions. We outline the derivation of the general formulae with which the wave functions of the motion of the center of mass can be separated. Taking  $Be^8$  as an example, the existence of the spurious states is illustrated and the components of these states and their corrections to the energy matrix elements are quantitatively evaluated. Through the analysis of the results of  $Be^8$  mentioned above we conclude: although the proportion of the spurious states is only several percent, their corrections to the fission barrier are significant, even larger than the corrections due to coulomb energy, and it is necessary to take them into account in accurate quantitative calculations. For a heavier nucleus, or higher excited states, the spurious states of the motion of the center of mass should be considered in more detail.

This paper was received for publication on 21 June 1974.

AUTHOR: TS'AO Ch'ang-ch'i [2580 2490 4388]  
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TITLE: "Deep Inelastic Electron-Proton Scattering (II)"

SOURCE: Peking WU-LI HSUEH-PAO [ACTA PHYSICA SINICA] Vol 25 No 4, July 76  
pp 308-315

TEXT OF ENGLISH ABSTRACT: Dyson representation is applied to find out whether the scaling property can be derived without reliance on the knocked-out mechanism. It is shown that, provided the spectral function in the Dyson representation of the matrix element of the current operators commutator has the proper behavior for large  $m^2$ , the scaling property then follows for large  $\nu$ . No restriction whatever is required for  $q^2$ , which may be very small even approaching zero. This characteristic seems to be consistent with the experiments. Furthermore, for a given  $\nu$ , the structure tensor  $W_{\mu\nu}$  is only determined by the spectral function inside the region  $m^2 \lesssim M_p \nu$ , with no dependence on the true asymptotic behavior at  $m^2 \rightarrow \infty$ . Therefore, the present observed scaling may only be a phenomena within a certain range. As  $\nu$  becomes still larger, the situation will probably change qualitatively.

This paper was received for publication on 13 June 1974.

AUTHOR: None

ORG: Elementary Particle Theory Group, Department of Physics, Peking University

TITLE: "Some Discussions on the Structure Wave Functions of Mesons for the Instantaneous Interaction Approximation (I) : General Properties of Wave Functions of Mesons in the Instantaneous Interaction Case"

SOURCE: Peking WU-LI HSUEH-PAO [ACTA PHYSICA SINICA] Vol 25 No 4, July 76  
pp 316-323

TEXT OF ENGLISH ABSTRACT: The present paper starts from the Bethe-Salpeter equation for the bound states of a fermion and anti-fermion pair. Assuming that the interaction between the straton and anti-straton can be represented approximately by an instantaneous interaction in the center of mass system, we obtain the following main conclusions: (1) The solution of the Bethe-Salpeter equation may be carried out in ordinary three dimensional space and the numbers of components of the wave functions for the pseudo-scalar and vector mesons reduce respectively from 4 and 8 to 2 and 4; (2) If the interaction is spherically symmetrical in space and its spinor structure is of the diagonal coupling type, then it is seen from the equation for the pseudo-scalar mesons that the meson mass appears as a quadratic eigen value in the equation, without leading to the negative energy excitation usually encountered in the four-dimensional equation; (3) The structure wave function obtained in the instantaneous interaction may be used to study both the mass spectra of the bound states, and the processes involving only the center of mass system.

This paper was received for publication on 10 October 1974.

AUTHOR: HSU Chi-an [1776 3444 1344]

ORG: Institute of Physics, Chinese Academy of Sciences

TITLE: "An Isothermal Equation of State for Solids"

SOURCE: Peking WU-LI HSUEH-PAO [ACTA PHYSICA SINICA] Vol 25 No 4, July 76  
pp 324-326

ABSTRACT: Equation of state for solids is used to study the relationship between volume, pressure, and temperature and the object of study is mostly isotropic solids of crystalline materials. Due to the extremely great practical significance, experimental determination is, in recent years, usually carried out. In the realm of high compression physics the concern is mainly the relationship between pressure and volume under isothermal condition. Theoretically, the interaction of atoms within the material can be derived with an equation of state, but in practice, this is difficult or even impossible. Some equations of macroscopic state are often used and experiments indicate that Murnaghan Equation is a very useful one. In recent years, with the development of high compression supersonic technique, high order revision of the Murnaghan Equation is being studied to cause it to be closer to experimental results. At present, measured data remain insufficient. The accuracy of the revised equation proposed in the paper is in need of further confirmation.

This paper was received for publication on 4 February 1975.

AUTHOR: YANG Ying-ch'ang [2799 2019 2490]

ORG: Department of Physics, Peking University

TITLE: "On the Coercivity of the  $RCo_5$  Compounds"

SOURCE: Peking WU-LI HSUEH-PAO [ACTA PHYSICA SINICA] Vol 25 No 4, July 76  
pp 327-330

ABSTRACT: Rare-earth elements, represented by R, and cobalt can form a series of intermetallic compounds. All crystal structures of high cobalt compounds are derived from  $RCo_5$ . This type of magnetic crystal is highly anisotropic. The direction of easy magnetization parallels the c axis. On the basis of the  $RCo_5$  structure, if one third of the R atoms are orderly replaced by Co atoms, the  $R_2Co_{17}$  structure will be formed. The anisotropy of the magnetic crystal of  $R_2Co_{17}$  is lower than that of  $RCo_5$ , while with respect to light rare earths, except for  $Sm_2Co_{17}$ , the direction of easy magnetization is perpendicular to the c axis. As the ideal structure of the  $RCo_5$  phase is unstable under room temperature, a tendency of disorderly replacement of a R atom by a pair of Co atoms exists and may have an effect on anisotropy. This amounts to a form of shortcoming. This paper studies the effect of this disorderly replacement on anisotropy of magnetic crystals of  $SmCo_5$  and  $YCo_5$  and their coercivity. Experimental results are given.

This paper was received for publication on 26 January 1976.

AUTHOR: LI Pin-an [2621 3521 1344]  
YUAN T'ung-tse [7086 0681 3419]

ORG: Both of Institute of High Energy Physics, Chinese Academy of Sciences

TITLE: "Mesonic Wave Functions at Zero Point and Decay Processes  $\pi \mu_2 \rightarrow e^+ e^-$ "

SOURCE: Peking WU-LI HSUEH-PAO [ACTA PHYSICA SINICA] Vol 25 No 4, July 76  
pp 331-335

ABSTRACT: This paper is an attempt to discuss zero point wave functions of  $0^-$  and  $1^-$  mesons, using the Bethe-Salpeter equation, based upon the meson wave function and the primary straton weak flow and straton electromagnetic flow proposed in the paper by LI Pin-an in WU-LI HSUEH-PAO Vol 24, 1975 p 21. The relationship between the zero point wave functions of  $0^-$ ,  $1^-$  mesons and mass:  $X_2(Q) = A(1 + b/m)$  is given, where  $A$ ,  $b$  are parameters unrelated to mass,  $m$  is the physical mass of the corresponding meson. This form of functions may be used to interpret the probability of  $\pi \mu_2 \rightarrow e^+ e^-$  decay processes. The straton model was discovered a few years ago [1966] in the process of discussing  $\pi \mu_2 \rightarrow e^+ e^-$  decay process. This paper is a part of the attempt to prove the theory to be in agreement with experimental data.

This paper was received for publication on 4 February 1975.

AUTHOR: NI Kuang-chiung [0242 0342 3518]

ORG: Second Department of Physics, Fu-tan University

TITLE: "The Pairing Vibration Model of Meson States"

SOURCE: Peking WU-LI HSUEH-PAO [ACTA PHYSICA SINICA] Vol 25 No 4, July 76  
pp 336-339

ABSTRACT: In 1961 Nambu and Jona-Lasinio proposed a superconduction theory of elementary particles. They noted the similarity between the Dirac equation and the superconduction equation and pointed out that it is possible that the origin of electron mass is the pairing interaction between the mass-less fermions. In this paper, the author proceeds to discuss a "superconduction" model of hadron and to borrow the Bés and Broglia "pairing vibration" model in nuclear physics for the purpose of discussing the "pairing vibration" meson states formed by interference excitation of positive-negative hadron pair.

This paper was received for publication on 4 February 1975.

AUTHOR: WANG Ting-sheng [3769 0002 4141]  
P'U Fu-k'o [5543 1381 1870]

ORG: Both of Institute of Physics, Chinese Academy of Sciences

TITLE: "A Simple Model for Non-Uniform Ferromagnets"

SOURCE: Peking WU-LI HSUEH-PAO [ACTA PHYSICA SINICA] Vol 25 No 4, July 76  
pp 340-341

ABSTRACT: A simple mathematical model is offered to demonstrate that the non-uniformity of interaction causes the Curie point to be higher, but the magnetization thus occurs is non-uniform; therefore, the average intensity of magnetization is correspondingly reduced. In a system of obvious non-uniformity, it is possible for the phenomenon of extremely localized magnetization to appear. In an amplitude modulation phase of spinodal decomposition formation, the periodic change of composition and crystal lattice constant may cause it to be possible to form periodic variation of the exchange action, and the above described localized magnetization may occur. Besides, in some non-crystalline alloys of certain rare-earth intermetallic compounds, the condition of extremely non-uniform exchange may occur to cause peculiar phenomena to appear. The model here presented is an extreme simplification of the real system, but it may provide some qualitative recognition of the magnetization of non-uniform ferromagnets.

This paper was received for Publication on 29 May 1976.

AUTHOR: None

ORG: Emulsion Chamber Group, Institute of High Energy Physics, Chinese Academy of Sciences

TITLE: "A Preliminary Study of Ultra-High Energy  $\gamma$ -Rays Using an Emulsion Chamber"

SOURCE: Peking WU-LI HSUEH-PAO [ACTA PHYSICA SINICA] Vol 25 No 4, July 76  
pp 342-343

ABSTRACT: A small emulsion chamber was erected on a high mountain of an elevation of 3200 m. X-ray films produced in China were used. They were installed for about one year. After treatment, the preliminary results of measurements generally agree with the results of many years of surveying reported by other scientists. The black spots of electromagnetic rays recorded on the X-ray films made in China have clear stratification and relatively fine granules. This paper was received for publication on 1 April 1976.

AUTHOR: None

ORG: Fracture and Toughness Group, Class 1973-2, Metal Physics Specialty, Peking Institute of Iron and Steel Technology

TITLE: "Measurement of the Initiation of Crack Propagation by an Electrical Resistance Method"

SOURCE: Peking WU-LI HSUEH-PAO [ACTA PHYSICA SINICA] Vol 25 No 4, July 76 pp 344-351

ABSTRACT: At present, many techniques have been developed to determine the initiation of crack, including the sonic wave technique, the electric potential technique, the softness technique, and the metal phase technique. This paper reports an electrical resistance technique developed by the authors. The results of the experiment described in the paper demonstrate that through measurements of the variation of electrical resistance of both sides of a deep crack sample developed during a loading process, the initial point from which the crack begins to develop can be satisfactorily and precisely determined. The shortcoming of this technique is the fact that it cannot be automatically recorded.

This paper was received for publication on 26 December 1975.

AUTHOR: None

ORG: Speech Recognition Research Group, Institute of Physics, Chinese Academy of Sciences

TITLE: "The Use of Correlation Matrices in Spoken Digits Recognition"

SOURCE: Peking WU-LI HSUEH-PAO [ACTA PHYSICA SINICA] Vol 25 No 4, July 76 pp 352-354

ABSTRACT: For the purpose of improving the degree of automation, it is necessary to find the most convenient way for man to communicate with machines so that such work processes as start, stop, arranging plates, computing, recording, etc. may be implemented by the machine through voice command. Due to the fact that the physiological process of the human language and its special characteristics are not yet sufficiently understood, it is not yet possible to make a machine capable of recognizing all words of the human language; it can only be made to recognize a few special phrases. Since 1971, the authors have been studying the recognition of spoken words of the Han language in China for the purpose of finding its sonic characteristics and at the same time making an attempt to apply it in a limited way. This paper introduces the theory of correlation matrices and the technique of experimenting with its application in spoken digits recognition. This paper was received for publication on 26 March 1976.

AUTHOR: CH'IN Yuang-hsun [4440 0337 8113]

ORG: Institute of Mathematics, Chinese Academy of Sciences

TITLE: "Theory of Local Instantaneous Symmetry of Space-Time Under Variable Velocity Condition"

SOURCE: Peking WU-LI HSUEH-PAO [ACTA PHYSICA SINICA] Vol 25 No 4, July 76  
pp 355-361

ABSTRACT: This paper proposes a feasible hypothesis for dealing with the problem of gravitational force. If the Newtonian equation of gravitational force is adopted, we obtain the Schwarzschild's formula of the general theory of relativity. If the relationship between mass and velocity is taken into consideration, we obtain a new type of formula which invalidates the black hole theory. In a previously published paper [WU-LI No 4, 1975 pp 57-62] the author studied the interaction of two space-time systems under uniform velocity condition and introduced the physical concept of "space-time symmetry under uniform velocity condition." It is only natural to proceed with the study of the same problem under variable velocity condition. The Newtonian black hole, as derived by Laplace, was declared nonexistent by the special theory of relativity, with the consideration of mass-velocity relationship. In this paper, the Einstein's black hole, as derived by Oppenheimer, is judged to be nonexistent by virtue of the same consideration of the mass-velocity relationship.

This paper was received for publication on 4 March 1974.

AUTHOR: LIU Liao [0491 6697]

YANG I-hung [2799 0110 7703]

CH'EN Fang-p'ei [7115 2455 1014]

SHAO Chi-ch'un [6730 3444 5028]

ORG: LIU of Department of Physics, Peking Normal University; YANG of Lung-hsien Middle School, Shensi Province; CH'EN of Ta-lien College of Engineering; SHAO of Chinghai College of Engineering and Agriculture.

TITLE: "Some Comments on the 'Classical Space-Time Model'"

SOURCE: Peking WU-LI HSUEH-PAO [ACTA PHYSICA SINICA] Vol 25 No 4, July 76  
pp 362-366

ABSTRACT: Since the publication of two papers on the subject of classical space-time model [WU-LI HSUEH-PAO Vol 23, 1974 p 225; and Vol 24, 1975 p 381] in this journal, a number of letters have been received offering differing viewpoints on several related problems concerning the subject matter. Four of these are selected and published to form this paper.

6168

CSO: 4009

GEOGRAPHICAL KNOWLEDGE

AUTHOR: None

ORG: Department of Geography, Hopeh Normal University

SOURCE: Peking TI-LI CHIH-SHIH [GEOGRAPHICAL KNOWLEDGE] No 7, Jul 76  
pp 5-6 & 10

ABSTRACT: Hsi-po-p'o had once been a location of the Party Central Committee. Hsi-po-p'o is a village in the T'ai-hang Mountain region, on the northern bank of Kang-nan Water Reservoir in the upper Hu-t'o River. Chairman Mao lived in Hsi-po-p'o from May 1948 to March 1949 just before the victorious conclusion of the Liberation war. Two reservoirs, Kang-nan and Huang-pi-chuang, built after 1958 irrigate orchards and farmland. Today more than 90 percent of the total farmland in the area is irrigated and the mou unit grain yield is over 1000 chin in 1974. Reforestation is quite extensive thanks to trees planted by the revolutionary masses in the Great Leap Forward and the Great Cultural Revolution. One photograph and one map are included.

AUTHOR: KAO HSIA [7559/0204]

ORG: None

TITLE: "Gigantic Tasks Performed Along the Thousands of Miles of the Yangtze River"

SOURCE: Peking TI-LI CHIH-SHIH [GEOGRAPHICAL KNOWLEDGE] No 7, Jul 76  
pp 7-10

ABSTRACT: The Yangtze River has a vast drainage area of 1.8 million square kilometers with 400 million mou of farmland inhabited by a population of 300 million. This article describes the Yangtze dike rebuilt for flood prevention and various irrigation projects along the river. Steamship navigation routes were extended to over 30,000 km from less than 10,000 km at the beginning of Liberation. The trunk stream from I-pin to I-ch'ang was dredged after the Liberation for a 30 percent deeper and an 80 percent wider navigation channel. The present monthly volume of freight moved on the Yangtze River is greater than the annual volume before the Liberation. Since the Cultural Revolution, more than 20,000 small rural hydroelectric stations were built in the basin. A map shows the water conservation projects.

AUTHORS: CH'IN CH'ANG-HUI [4440/2490/1920]  
WU MING [0702/2494]

ORG: None

TITLE: "A Ride on the Chiao-tso -- Chih-ch'eng Railroad"

SOURCE: Peking TI-LI CHIH-SHIH [GEOGRAPHICAL KNOWLEDGE] No 7, Jul 76  
pp 11-14 & 26

ABSTRACT: The Chiao-tso -- Chih-ch'eng Railroad runs through Honan and Hupeh provinces with a total length of 753.3 km. Construction began November 1969 and was completed 1 July 1970. The major freight item is coal since its reserve is extensive from Chiao-tso to Lu-shan along the railroad. Nan-yang Basin lies midway along the rail line; the basin is well known for its wheat and cattle but suffered severe coal shortages in the past. After the railroad was completed, chemical fertilizer plants and textile mills were built. The Hsiang-fan Bridge on the Han River was completed in 194 days. The Chih-ch'eng Yangtze Bridge is of the suspension tower type, to save steel. New wharves were constructed at the Chih-ch'eng river port; coal and phosphate rock wharves are separated. One table, one map and two photographs are included.

AUTHOR: LAI MIN-ERH [6351/3046/0059]

ORG: None

TITLE: "Shang-jao's New Appearance"

SOURCE: Peking TI-LI CHIH-SHIH [GEOGRAPHICAL KNOWLEDGE] No 7, Jul 76  
pp 15-16 & 4

ABSTRACT: Shang-jao is a county in Kiangsi Province on the northern bank of Hsin River. The Chekiang -- Kiangsi Railroad passes through the area. The Shang-jao Hydroelectric Equipment Plant is typical of Shang-jao's industrial growth. The plant builds Model 363 3000-KW hydraulic turbines. The Shang-jao Motor Vehicle Plant was expanded after the Cultural Revolution for building buses. County industrial output climbed 9.5-fold in 1975 compared with 1950. Rail freight volume was twenty-fold higher than before the Liberation. Loading and unloading have been mechanized. Mao-chia-ling is a suburb, 5 km from the city. The site was known as the Shang-jao Concentration Camp before the Liberation. One diagram and one map are included.

AUTHOR: None

ORG: None

TITLE: "Mao-ming, An Oil-Producing City in South China"

SOURCE: Peking TI-LI CHIH-SHIH [GEOGRAPHICAL KNOWLEDGE] No 7, Jul 76  
p 17

ABSTRACT: Mao-ming is in the southwestern Kwangtung. Nearby there are abundant reserves of oil shale in a Tertiary shallow-water gulf deposit. Average oil content is 9-11 percent. Large-scale exploitation was begun in 1958. Since the Cultural Revolution, the Mao-ming Petroleum Industrial Corporation has produced gasoline, diesel oil, kerosene, gear oil, aqua ammonia and asphalt. Petrochemicals, such as Ch'ing-lun (2532/4858) [acrylic], plastics, chemical fertilizers and pesticides, are also made in large amounts. The product line numbers more than 70. The photograph shows part of the Petroleum Refinery of the Mao-ming Petroleum Industrial Corporation.

AUTHOR: None

ORG: None

TITLE: "Rapid Industrial Growth in Wu-hsi's Communes and Production Brigades"

SOURCE: Peking TI-LI CHIH-SHIH [GEOGRAPHICAL KNOWLEDGE] No 7, Jul 76  
p 17

ABSTRACT: Before the Cultural Revolution, there were only 35 minor factories with an annual output of 5,500,000 yuan for all industries operated by communes and production brigades in Wu-hsi County, Kiangsu Province. Today factories number 1962 -- with a total output of 176 million yuan -- and are operated by communes and production brigades. Electric motors, transformers, hulling machines, sprayers and water pumps are produced in large numbers. Countywide, there is a total of 210,000 hp, averaging 1 hp per 4 mou of farmland. This capacity leads to mechanization and semi-mechanization of cultivation, hulling, plant protection, irrigation, drainage and feedstuff processing. The photograph shows the county party committee members inspecting an agricultural implement repair plant of Yang-shih Commune.

AUTHOR: None

ORG: None

TITLE: "Hsing-lung Overseas Chinese Farm on Hai-nan Island"

SOURCE: Peking TI-LI CHIH-SHIH [GEOGRAPHICAL KNOWLEDGE] No 7, Jul 76  
p 17

ABSTRACT: The Hsing-lung Overseas Chinese Farm lies on the banks of the T'ai-yang River on southeastern Hai-nan Island. It is a state-operated farm raising tropical crops, including pepper, coffee and cocoa. The main cash crop is rubber and its 1975 output was 113-fold over 1965. Basically, self-sufficiency was achieved by the farm in grain, meat, edible oil and vegetables. Some agricultural implements can be manufactured right on the farm. The overseas Chinese workers are drawn from 18 countries and helped reclaim the rain forests into orchards to grow tropical crops. The photograph shows workers collecting latex at dawn.

AUTHOR: None

ORG: None

TITLE: "Today's Ch'ang-tu"

SOURCE: Peking TI-LI CHIH-SHIH [GEOGRAPHICAL KNOWLEDGE] No 7, Jul 76  
p 18

ABSTRACT: Ch'ang-tu is located in eastern Tibet. Before the Liberation, not even a single screw could be manufactured there but today there are more than 20 industries, including coal, electric power, machinery, agricultural implements, cement, leather, lumber, chemical fertilizer, food processing and other light industries. Product varieties total 48. Total 1974 industrial output rose by more than sevenfold over 1965. Total area of farmland is 1100 mou due to construction of terrace fields. Total construction area of new buildings at Ch'ang-tu is 470,000 square meters; this amounts to 47-fold compared to before the Liberation. The Szechwan -- Tibet Highway runs through the city; pictured is a highway bridge east of Ch'ang-tu.

AUTHOR: None

ORG: Hopeh Provincial Institute of Geography

TITLE: "Seeking Ancient River Channels and Exploiting Ground Water -- Masses' Experiences at Hei-lung-chiang Area of Hopeh Province"

SOURCE: Peking TI-LI CHIH-SHIH [GEOGRAPHICAL KNOWLEDGE] No 7, Jul 76  
pp 27-30

ABSTRACT: Ancient river channels are distributed in mountainous areas, plains and seabed; there are ancient river channels in the geological and historical times. This article tells of searches for ancient river channels in historical time. In the Hei-lung-chiang area, the Yellow River, Chang River and Hu-t'o River shifted their channels in written history. Generally, the depth of these channels is within 20-30 meters. In the ancient channel, the sand layer is thick with large particles; thus, much fresh water can be stored. At the bottom, usually a clay layer was deposited trapping the water. From preliminary investigation, hundreds of ancient river channels were traced in the Hei-lung-chiang area; these channels are an important water source in drought prevention. This article further emphasizes the resupply of fresh water into the underground channels to keep ground water at a certain level. Two diagrams and two maps are included.

AUTHOR: LIN CHIH-KUANG [2651/0037/0342]

ORG: None

TITLE: "'Three Large Furnaces' Along the Yangtze River -- Nanking, Wuhan and Chungking"

SOURCE: Peking TI-LI CHIH-SHIH [GEOGRAPHICAL KNOWLEDGE] No 7, Jul 76  
pp 31-32

ABSTRACT: When the atmospheric temperature is higher than 32°C, normal skin temperature, the air heats the human body. Perspiring is the natural way of dissipating the body heat. Thus, days with temperature higher than 32°C are called hot days; and days higher than 37°C are called extremely hot days. The three Yangtze ports, Nanking, Wuhan and Chungking, have an average of 50-70 hot days and 3-14 extremely hot days in a year. So they are called the three large furnaces along the Yangtze. There are paddy fields surrounding the three ports, so the combined effect of high temperature and high humidity makes life miserable in summer. Although the summer heat is disadvantageous to human activity, yet it is asserted the heavy heat spurs the growth of paddy rice and cotton in the Yangtze Basin. One table of temperature statistics is included.

AUTHOR: None

ORG: CHUNG-KUO CHIEN-SHE [CHINA RECONSTRUCTS] Publishing Service;  
JEN-MIN HUA-PAO [CHINA PICTORIAL] Publishing Service

TITLE: "Captions to Photographs on Front Cover, Inside Front Cover  
and Back Cover"

SOURCE: Peking TI-LI CHIH-SHIH [GEOGRAPHICAL KNOWLEDGE] No 7, Jul 76  
pp front cover, inside front cover and back cover

ABSTRACT: The subject of the front cover photograph is "Regulation of Navigation Channels Through Yangtze Gorges". It shows shoals and reefs being cleared by dynamiting. The subject of inside front cover photographs is "Propagation of Ta-chai Type Land Reclamation, Hsi-yang County." Six photographs show land reclamation, Ta-chai Nitrogenous Fertilizer Plant, water spraying used as irrigation, construction of culverts for flood drainage and land filling in the capital construction of farmland, a general view of Ta-chai and county party committee cadres meeting for a discussion. "One Corner of Chun-ying Water Reservoir in Hsi-yang County" is the subject of the back cover photograph.

10424  
CSO: 4009/19

ACTA PALAEONTOLOGICA SINICA

AUTHOR: None

ORG: Institute of Scientific Research and Designing, Ta-ch'ing Oil Field

TITLE: "On the Discovery of Balmeisporites From Ta-ch'ing Oil Field and Its Significance"

SOURCE: Peking KU-SHENG-WU HSUEH-PAO [ACTA PALAEONTOLOGICA SINICA] in Chinese No 2, Sep 76 pp 132-146

TEXT OF ENGLISH ABSTRACT: Copious "megaspores" of Balmeisporites occur in the Mesozoic strata of Ta'ch'ing Oil Field. They are larger in size and various in morphological aspects. Here a description is given of 2 genera and 10 species, of which 1 genus and 8 species are recognized as new to science. In this paper a brief discussion is made of the sedimentary environment and facies, in consideration of which their stratigraphical correlation is also proposed. Besides, the Balmeisporites-bearing beds, i.e. the upper part of the Ch'ing-shan-k'ou formation and the lower part of the Yao-chia formation are regarded as belonging to late Cretaceous in age.

AUTHOR: SUNG Chih-ch'en [1345 0037 3819]  
TS'AO Liu [2580 3155]

ORG: Both of Nanking Institute of Geology and Palaeontology, Chinese Academy of Sciences

TITLE: "The Paleocene Spores and Pollen Grains From the Fu-shun Coalfield, Northeast China"

SOURCE: Peking KU-SHENG-WU HSUEH-PAO [ACTA PALAEONTOLOGICA SINICA] in Chinese No 2, Sep 76 pp 147-162

TEXT OF ENGLISH ABSTRACT: The city of Fu-shun is famous for its coal in China. The Lower Tertiary of the Fu-shun Coalfield comprises, in ascending order, the basalt seam, the basalt-tuff seam intercalated with coal-group B, the tuff seam intercalated with coal-group A, the main coal seam, the oil shale seam, and the green shale and mudstone seam. The present paper deals chiefly with the spores and pollen grains obtained from the coal-group B. A total of 35 spores and pollen grains species are here described and illustrated, with 20 new species included. *Triatriopollenites confusus* Zakl. (*Paraalnipollenites confusus*) identified by Bratzeva (1969) et al. as being dissimilar in the specific diagnosis to *T. confusus* by Zaklinskaja (1963, p 232) apparently coincides with the new genus of *Fushunpollis* erected in this paper. Based on the occurrence of *Sporopollis singularis*, *S. pseudosporites*, *S. cf. triporinus*, *Plicapollis plicatus*, *Betulaepollenites claripites*, *B. plicoides*, *Fushunpollis arcuatus* = *Paraalnipollenites confusus*, and especially abundant *Fushunpollis*, this palynological assemblage should be assigned to Paleocene, representing the earliest Tertiary flora.

AUTHOR: None

ORG: Fifth Division, North China Institute of Geology

TITLE: "The Fossil Plant Cephalotaxopsis From Inner Mongolia"

SOURCE: Peking KU-SHENG-WU HSUEH-PAO [ACTA PALAEONTOLOGICA SINICA] in Chinese No 2, Sep 76 pp 165-173

EXCERPT OF ENGLISH ABSTRACT: This paper deals mainly with a new species *Cephalotaxopsis asiatica* found from the Lower Cretaceous deposits in Ch'i-hsia-ying - Cho-Tzu-hsien Basin of Ta-ch'ing-shan area, Inner Mongolia. The new form stands very near to *Cephalogaxopsis magnifolia* Fontaine, one of the most characteristic species of the Potomac flora in North America. All the American specimens referred to *Cephalotaxopsis*, as pointed out by many authors, are much exaggeratedly described and somewhat incorrectly sketched by Fontaine, thereby, a close comparison between the American species and our form is impossible at present. The present new form seems, however, to be distinguished from the American one by a number of characteristics.

AUTHOR: WANG Chen [3769 2182]

ORG: Nanking Institute of Geology and Paleontology, Chinese Academy of Sciences

TITLE: "Middle Devonian Sycidium and Chovanella From Southwest China"

SOURCE: Peking KU-SHENG-WU HSUEH-PAO [ACTA PALAEONTOLOGICA SINICA] in Chinese No 2, Sep 76 pp 175-185

EXCERPT OF ENGLISH ABSTRACT: The purpose of this paper is to describe some species of Sycidiales collected from Yunnan, Kueichow, Hunan, Szechwan, and Tibet. The collections contain 4 species of *Sycidium* and 1 species of *Chovanella*, of which *Chovanella* is for the first time reported in China. The Charophyte-bearing deposits may be assignable to the Middle Devonian Tung-kang-ling Stage, corresponding to the Givetian Stage in Europe. Peck (1934) believed that 18 meridional units on the lime-shell of *Sycidium* were formed by vertical division of 9 original cells budded from the outer surface of the node-cell. However, the well-preserved specimens under study indicate that around the basal orifice there exist only 8 cells and that the manner of cell division is obviously much more complicated. In *Sycidium*, one of the characteristic features is the polygonal reticulate pattern on the lime-shell. The discovery of similar pattern on the cast of oosphere of *Sycidium anhuaense* sp. nov. affords an additional evidence for the suggestion that the lime-shell of *Sycidium* is a true gyrogonite instead of being a utricle.

AUTHOR: WANG K'o-liang [3769 0344 5328]

ORG: Nanking Institute of Geology and Paleontology, Chinese Academy of Sciences

TITLE: "The Foraminifera From the Chang-hsing Formation in Western KWeichow"

SOURCE: Peking KU-SHENG-WU HSUEH-PAO [ACTA PALAEONTOLOGICA SINICA] in Chinese No 2, Sep 76 pp 187-194

EXCERPT OF ENGLISH ABSTRACT: The foraminifera described and figured in this paper were collected from the Chang-hsing formation in Western KWeichow. They were found together with Palaeofusulina and Brachiopods in calcareous silt-stone and light gray limestone. Twelve genera and 13 species (including 7 new species) are here listed. So far as the faunal features are concerned, the genera Colaniella and Robuloides are known to be widely distributed in the Tethyan region. The genus Colaniella may be regarded as one of zone fossils for the Chang-hsing limestone in Szechwan, Shansi, Kiangsi, and Hunan of China. *Frondicularia inflata* (K.M.-Maclay,) *Colaniella nana* K.M.-Maclay, *Colaniella cylindrica* K.M.-Maclay and *Geinitzina tcherdynzevi* K.M.-Maclay, etc. have been known commonly from the Upper Permian of N. Caucasus, U.S.S.R., *Robuloides acutus* Reichel has been reported from the foraminiferal limestone of Greece. Accordingly, the foraminiferal fauna from the Chang-hsing formation in Western Kweichow, accepted as belonging to late Upper Permian in age, may be correlated with that from the Nikitin formation in N. Caucasus.

AUTHOR: SHENG Chin-chang [4141 6855 1728]

MIN Ch'ing-k'uei [7036 1987 7608]

WANG Li-li [3769 5461 5461]

ORG: SHENG, of Nanking Institute of Geology and Paleontology, Chinese Academy of Sciences; MIN, WANG of Regional Survey Team, Anhwei Provincial Bureau of Geology

TITLE: "Fusulinid Zones of the Middle Carboniferous Huang-lung Limestone at Chin-szu-kang Near Nanking"

SOURCE: Peking KU-SHENG-WU HSUEH-PAO [ACTA PALAEONTOLOGICA SINICA] in Chinese No 2, Sep 76 pp 196-210

EXCERPT OF ENGLISH ABSTRACT: This paper is to record one of the sections of the Middle Carboniferous Huang-lung Limestone, which is exposed at Chin-szu-kang in the vicinity of Nanking. The section, attaining a thickness of 79.88m, is overlain and underlain without any obvious break by the Upper Carboniferous Ch'uan-shan Limestone and the Lower Carboniferous Lao-hu-tung Dolomite respectively. Fusulinids are abundant in the limestone, 9 genera and 43 species and subspecies are studied. According to the vertical distribution of fusulinid faunas, 2 zones and 3 subzones may be recognized in ascending order. Two new species are described in detail in the Chinese text: *Profusulinella montichomata* Sheng et Wang sp. nov. is known in the *Profusulinella* zone, and *Fusulinella microlocula* Sheng et Wang sp. nov. is visible in the *Fusulinella praebocki* subzone.

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TITLE: "Late Permian Rugose Corals From An-shun, Liu-chih, Ch'ing-lung, K'eichow Province"

SOURCE: Peking KU-SHENG-WU HSUEH-PAO [ACTA PALAEONTOLOGICA SINICA] in Chinese No 2 Sep 76 pp 213-222

TEXT OF ENGLISH ABSTRACT: This paper deals with coral fossils obtained from the Wu-chia-ping and the Chang-hsing formations in An-shun, Liu-chih, and Ch'ing-lung, western KWeichow, with a discussion about the geological age of Plerophyllum. So far as the writer is aware, Plerophyllum has been recorded chiefly in the Permian of South China, but unknown in any Mesozoic sediments. Paracaninia, one of the common forms in the Lower Permian, made its appearance in the upper part of the Chang-hsing formation of late Permian. Therefore, it may be concluded that this genus ranges in age from early Permian to late Upper Permian. The new genus Aridophyllum from the lower part of the Wu-chia-ping formation closely resembles Ipciphyllum commonly known in the Mao-k'ou formation. From the morphological and stratigraphical viewpoints, it seems that Aridophyllum derived from Ipciphyllum. Described in this paper are 8 genera and 15 species, including 1 new genus, 11 new species and 1 indeterminate species. The finding of rugose corals is, undoubtedly, of high importance to the correlation of the Upper Permian.

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TITLE: "Some Middle Carboniferous Tetracorals From Southern Kiangsu"

SOURCE: Peking KU-SHENG-WU HSUEH-PAO [ACTA PALAEONTOLOGICA SINICA] in Chinese No 2, Sep 76 pp 224-229

TEXT OF ENGLISH ABSTRACT: The tetracorals dealt with in the paper were collected from the Middle Carboniferous Huang-lung and Ting-shan formations in I-hsing, Wu-hsien, and Chu-jung Districts, southern Kiangsu. They contain 8 genera and 10 species, of which 1 genus and 8 species are considered as new to science. Discovered in the Huang-lung limestone are the following species Caninia skolekophyloides sp. nov., Protoivanovia intermedia sp. nov., Cystolonsdaleia wenhuashanensis sp. nov. and Huanglongophyllum simplex gen. et sp. nov., which indicate that the fossil-bearing formation may be equivalent to the Middle Carboniferous Moscovian. Underlying the Huang-lung Limestone is the Tian-shan formation, which consists of gray thick-bedded dolomites intercalated with 2-3 layers of limestones. Found in this formation are Caninia ephippia sp. nov., Fomitchevella sinensis sp. nov. Lithostrotionella stylaxis (Tautschold) and L. belinskienensis (Fomitchev,) which show that the fossiliferous formation may be corresponding to the Upper Bashkirian.

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TITLE: "A New Ostracode Genus Paramoelleritia From the Devonian Deposits in Kuangsi"

SOURCE: Peking KU-SHENG-WU HSUEH-PAO [ACTA PALAEONTOLOGICA SINICA] in Chinese No 2, Sep 76 pp 231-239

EXCERPT OF ENGLISH ABSTRACT: This paper is to describe a new ostracode genus, Paramoelleritia, which includes 5 new species (P. xiangzhouensis, P. miaohuangensis, P. subovata, P. subtrapezoidalis, P. beiliuensis) and 2 new subspecies (P. xiangzhouensis magna, P. miaohuangensis parva,) all collected from the "Szu-p'ai Formation" and the "Ying-t'ang Formation" in the Hsiang-chou and Wu-hsuan districts, and Pei-liu Formation in the Pei-liu district of Kuangsi. The new genus Paramoelleritia under study is easily distinguished from the other genera of the Family Leperditiidae by a clear curving-conic mandibular muscular scar (known commonly as "chevron") which has also recently been found in the Middle Devonian, representing an advanced type. Therefore, it may be suggested that in the Family of Leperditiidae, the arrangement of mandibular muscular scar has changed evolutionarily from irregular to V-shaped and then to conic-shaped. Besides, the new genus Paramoelleritia is closely allied to Moelleritia from the Middle Devonian formations of Canada and U.S.S.R. and the Paramoelleritia-bearing beds may be referable to the Middle Devonian.

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SOURCE: Peking KU-SHENG-WU HSUEH-PAO [ACTA PALAEONTOLOGICA SINICA] in Chinese No 2, Sep 76 pp 241-243

TEXT OF ENGLISH ABSTRACT: Some corals of Humboldtia were collected in 1974 from the Lower Carboniferous limestones in Shidian of Yunan. Among the collection the new species Humboldtia renheqiaoensis has counter fossulae with clearly thickened septa around the 4 fissula. In this species cystosepiments are unseen in the nepionic stage, but irregularly arranged in the ephebic stage.

6168

CSO: 4009

GENETICS AND BREEDING

AUTHOR: None

ORG: Institute of Paddy Rice, Hunan Provincial Academy of Agriculture

TITLE: "There are no Difficult Things in the World; All It Needs is a Willingness to Climb: A Record of Success in Paddy Rice Hybridization Research in China"

SOURCE: Peking I-CH'UAN YU YU-CHUNG [GENETICS AND BREEDING] in Chinese No 5, Sep 76 pp 7-8

ABSTRACT: A paddy rice male sterile stalk was first discovered in a rice paddy in 1964 by some students and teachers of the Ch'ien-yang School of Agriculture of Hunan Province. In the winter of 1970, a student of the same school discovered, on the banks of a stream in Nan-hung Farm in Hainan Island a stalk of wild rice with degenerated pollen structure to form the origin of the paddy rice male sterile system, Yeh-pai. In March 1971, a nationwide program of rice hybridization research was established to create the 3 systems of male sterile, preserved, and recovery for the purpose of heterosis utilization. The 3 systems were successfully assembled in Kuangsi, Kuangtung, Hunan, and Kiangsi independently in 1973, and in many other provinces and regions since then. Compared with local varieties, the yield of the hybrid rice is 20-100% higher and smaller seed-beds are needed to supply each mu of paddies with seedlings. When

[continuation of I-CH'UAN YU YU-CHUNG No 5, 1976 pp 7-8]

the program was first launched, there were formidable oppositions. Some claimed that "rice is a self-pollinated crop; hybrid vigor does not exist." Some insisted that "it may be proper to have a few people devoting in the rice hybridization program, but there is no need for a mass movement." When all 3 systems began to appear, some proclaimed that "foreigners were not able to do this; this just cannot succeed in China." Others attempted to switch the direction of the research saying that "even heterosis does exist in rice, this program will take a very long time and will not become a reality in the life time of the present generation." It was the will of the masses of workers, soldiers, farmers, and scientific and technical staff who persisted in obeying Chairman Mao's teachings that brought hybrid rice to a reality. The history of the creation of hybrid rice in China is briefly recounted in the paper.

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TITLE: "Total Simplification of Paddy Rice Culture Media Basically Succeeded"

SOURCE: Peking I-CH'UAN YU-YU-CHUNG [GENETICS AND BREEDING] in Chinese No 5, Sep 76 pp 11-12

ABSTRACT: In the past 2 years, the authors have experimented with simplifying the Miller, the MS, and the White media required for paddy rice anther culture. Water extracts of sprouted or unsprouted white potatoes were used as the main raw materials. It has been discovered that for inducing callus tissue of Keng rice to sprout, both types of potato extracts can produce an induction rate of 22.2%, while with the Miller medium it was only 2.2%. The callus tissue is loose in structure, not as shiny, and has a yellowish color, but its rate of evolving green sprouts is much higher. To be used to replace the MS medium, the sprouted potato cannot be used because auxin and hormones cannot be added to the extract. Very good effects were also obtained with 10% and 20% water extracts of sprouted potato to replace White medium for rooting the green sprouts of rice anther culture. Results of the experiments are reported. The success of these experiments has provided a favorable condition for haploid breeding of paddy rice in the rural areas.

AUTHOR: None

ORG: Nan-pei Lake Fishery Earthquake Surveying and Reporting Team, Chung-hsiang-hsien, Hupei Province

TITLE: "Observation, Survey, and Research of Abnormal Reactions of Fishes Before an Earthquake"

SOURCE: Peking I-CH'UAN YU-YU-CHUNG [GENETICS AND BREEDING] in Chinese No 5, Sep 76 pp 13-14

ABSTRACT: On 31 July, 1917, about one month before the earthquake in Yunnan Province, fish were reported to be floating on the water surface of Ta-kuan-ho, appearing to have lost the ability to swim. A few days before the earthquake a large quantity of fish jumped ashore. Similar tales have been reported since then in Hsien-ch'i of Szechwan in 1933, People's Park in Tientsin in 1969, and Ying-k'ou of Liaoning in 1975. For the purpose of clarifying this matter, an earthquake reporting team was organized among the party committee members, the technicians, the workers, and the fishermen of the Nan-pei Lake Fishery in 1972 to observe the reactions of the various fish species while carrying out their normal work of fish production. Their observations of the past 5 years are preliminarily summarized.

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TITLE: "Heredity of Early Maturation Characteristic in Wheat"

SOURCE: Peking I-CH'UAN YU YU-CHUNG [GENETICS AND BREEDING] in Chinese No 5, Sep 76 p 15

ABSTRACT: Compared with wheat varieties of other countries of the world, Chinese wheat varieties mature relatively earlier. This is an outstanding characteristic and for the purpose of utilizing it to breed still earlier varieties to meet the needs of various regions of China in the effort of increasing the crop repeating index, a genetic study of this characteristic is carried out at the laboratory. The data of the past several years indicate that early maturity is primarily a dominant characteristic as well as a quantitative one. In breeding early maturing varieties, two genetic phenomena are significant. If the ripening time of the parent pair is both early and there is not much difference in the heading time, the early maturation characteristic of the hybrid offsprings will become stable relatively sooner. The other phenomenon is the fact that with continuous selection among the early maturing offsprings it is possible to obtain still earlier materials. The condition of segregation with respect to heading time of the  $F_2$  of several hybrid groupings is reported in a table to illustrate the above conclusions.

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TITLE: "Preliminary Report of Study on Male Sterile System of Corn"

SOURCE: Peking I-CH'UAN YU YU-CHUNG [GENETICS AND BREEDING] in Chinese No 5, Sep 76 pp 18-19

ABSTRACT: The utilization of the current T type male sterile system had to be discontinued due to the leaf spot disease. Attempts were made to use the current recovery system for hybridization and selection to breed a new male sterile system that is disease resistant. Most of the sterile lines thus obtained are not yet stable, but a few lines are basically stable now. Their major properties are described. The breeding process involves a so-called "cytoplasm filtration" technique which is briefly reported. In 1974 and the winter and spring of 1975 the new sterile systems were tested in Hainan Island as well as in I-ch'ang Branch. They appeared to be highly compatible for producing hybrids of high heterosis, and it appeared to be easy to find recovery systems for them. It is suggested that through genetic analysis of these new sterile systems, it is possible to enlarge the number of combinations for the purpose of producing still better male sterile hybrids.

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TITLE: "Technique of Overcoming Incompatibility and Infertility of Inter-specific Hybrids of Cotton"

SOURCE: Peking I-CH'UAN YU YU-CHUNG [GENETICS AND BREEDING] in Chinese No 5  
Sep 76 pp 20-21, 29

ABSTRACT: For the purpose of obtaining highly disease resistant, adversity resistant, and strong fiber cotton varieties, the authors experimented in 1973-75 with hybridization of cotton varieties with 13 chromosomes and upland or sea-island cotton with 26 chromosomes. Incompatibility of distant hybridization was overcome after spraying with gibberellin and NAA. In some combinations, the boll formation rate was more than 90%. The rate of success of vitro culture of the hybrid embryos was about 10%. All hybrids were male and female sterile, but the infertility of some of these was overcome after treatment with colchicine. The results of experiments of the past 3 years confirmed the hypothesis that incompatibility and infertility of distant hybrids reflect a physiological imbalance during the processes of fertilization and embryo development to appear as a metabolic disharmony which can be overcome

[continuation of I-CH'UAN YU YU-CHUNG No 5, 1976 pp 20-21, 29]

with a supply of suitably physiologically active materials. The treatment with colchicine can promote the combination of hereditary characteristics of the two distinctively different materials [the parent pair] in the hybrid offsprings and cause these characteristics to become quickly stabilized.

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TITLE: "Breeding 5406 Bacteria With Ultraviolet Induced Mutation"

SOURCE: Peking I-CH'UAN YU YU-CHUNG [GENETICS AND BREEDING] in Chinese No 5, Sep 76 pp 28-29

ABSTRACT: Currently, in the Hsin-hsien District, the phenomenon of degeneration is a general occurrence in the 5406 bacteria production process, the quality of the 5406 antibiotic fertilizer produced in this district is, therefore, seriously affected. The authors applied the technique of ultraviolet induction to the existing Yuan-nung 005 strain to produce a mutant strain for selective breeding. At present, 12 generations of the mutant have been bred out and degeneration phenomenon has not occurred. The technique is described in the paper. The properties of the mutant strain and the degenerated original strain are compared.

6168

CSO: 4009

END